Oxyurina
(Syphacia obvelata, Syphacia muris, Aspiculuris tetraptera)

**Host species:**
- Syphacia obvelata: mainly mouse (also rat, hamster, gerbil, wild rodents)
- Syphacia muris: mainly rat (also mouse, hamster, gerbil, wild rodents)
- Aspiculuris tetraptera: mouse, rat (rarely), wild rodents

**Organotropism:**
- intestinal tract: Syphacia primarily caecum / rectum, Aspiculuris primarily colon

**Life cycle:**

**Syphacia:**
direct cycle which requires only 11-15 days. Gravid females deposit their eggs in the perianal region. The eggs become infectious within 6 hours.

three possible infectious routes:
- direct: by ingestion of embryonated eggs from the perianal region
- indirect: by ingestion of food or water contaminated with embryonated eggs
- retroinfection: when eggs hatch in the perianal region and the larvae migrate back into the colon by way of the anus (Flynn, 1973)

**Aspiculuris:**
Direct cycle requires 23-25 days. Females lay their eggs in the colon and the eggs leave the host on faecal pellets. The eggs become infectious after 6-7 days at room temperature.

Infection by ingestion of infectious eggs (Flynn, 1973)

**Clinical disease:**
- subclinical
- symptoms are: poor condition, rough hair coats, reduced growth rate, rectal prolaps (Hoag, 1961; Harwell and Boyd, 1968; Jacobson and Reed, 1974)
- experimentally with S. muris infected animals grew slower than uninfected animals (Wagner, 1988)
- infection with S. muris retards the growth of young mice and accelerate the development of their hepatic monooxygenase system (Mohn and Philipp, 1981)
- no clinical signs in experimentally infected animals (Flynn, 1973; Wescott, 1982)

**Pathology:**
- the prevalence of pinworms in an infected rodent population depends on age, sex and host immune status
- in enzootically infected colonies, weanlings develop the greatest parasite loads, males are more heavily parasitizied than females
- Syphacia numbers diminish with increasing age of the host (Wescott, 1982)
- athymic (nu/nu) mice have increased susceptibility (Jacobson and Reed, 1974)
- Mastomys coucha is more susceptible than the BALB/c mouse (Higgins et al., 1990)
• in rats the infestation rates of Syphacia muris were higher in the WKY strain than in
the SHR strain (Lübcke et al., 1992)
• increase in resistance to pinworm infection with advancing age of rats (Wagner,
1988)
• pinworms of laboratory rodents are generally not considered pathogens (Flynn,
1973, Wescott, 1982)

Morbidity and mortality:
none

Zoonotic potential:
• S. obvelata seems to occur in people, but it has no known health significance
(Flynn, 1973; Kellogg et al., 1982; Ross et al., 1980; Wescott, 1982)

Interference with research:
• infection with pinworms reduces the occurrence of adjuvant-induced arthritis (Pear-
son and Taylor, 1975)
• infection alters the humoral response to nonparasitic antigenetic stimuli. This indica-
te that infection might modulate the immune system (Sato et al., 1995)
• infection with S. obvelata induces a proliferation of T- and B- lymphocytes in spleen
and lymph nodes and occasional germinal center formation (Beattie et al., 1981)
• athymic mice infected with pinworms develop a lymphoproliferative disorder which
eventually leads to lymphoma (Beattie et al., 1980; Baird et al., 1982)
• animals infected with pinworms are not suitable for growth studies (Wagner, 1988)
• infection with S. obvelata in mice causes a significant reduction of activity in behavi-
oral studies (McNair and Timmons, 1977)
• in rats, intestinal transport of water and electrolytes is significantly decreased due to
pinworm infection (Lübcke et al., 1992)

Notice:
• the eggs of pinworms survive for weeks in the animal room environment (Flynn,
1973; Klement et al., 1996)

References:
Baird, S. M., G. M. Beattie, A. Lannom, J. S. Lipsick, , and N. O. Kaplan. 1981. Induction of

T- and B- lymphocyte responses in antgenitically stimulated athymic mice. Cancer Research
41:2322-2327.

Sci. 77:4971-4974.


Author: Brunhilde Illgen-Wilcke, Novartis, Switzerland